DOCUMENT RESUME

ED 417 719 IR 056 941

AUTHOR	Bertot, John Carlo; McClure, Charles R.
TITLE	Policy Issues & Strategies Affecting Public Libraries in the National Networked Environment: Moving beyond Connectivity.
INSTITUTION	National Commission on Libraries and Information Science, Washington, DC.
PUB DATE	1997-12-00
NOTE	34p.
AVAILABLE FROM	U.S. National Commission on Libraries and Information Science, 1110 Vermont Ave., NW, Suite 820, Washington, DC 20005-3522. Electronic version: http://www.nclis.gov/
PUB TYPE	Reports - Evaluative (142)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	*Access to Information; *Community Information Services; Costs; Data Collection; Geographic Distribution; Government Role; Information Dissemination; Information Networks; *Information Policy; *Internet; Library Policy; *Library Role; *Public Libraries; Public Policy; Shared Library Resources; Strategic Planning; Telecommunications; World Wide Web
IDENTIFIERS	*Connectivity; *Information Equity; *Library Services and Technology Act 1996; *Universal Service (Telecommunications)

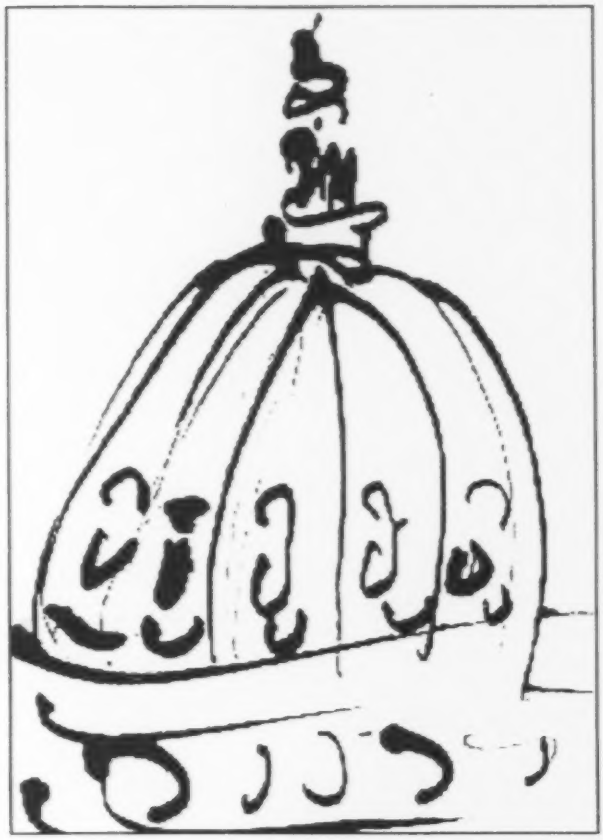
ABSTRACT

This report discusses selected issues regarding public library Internet connectivity, costs, and use. It discusses the implications of the "1997 Public Libraries and the Internet" study and presents policy recommendations related to the study's findings. This report suggests the importance of federal policy and library management in considering issues beyond simply connecting to the Internet. Questions about the unequal distribution of Internet connectivity, costs and provision of service across library population of legal service areas are raised. The 1997 Study used sample data from "Public Libraries in the United States: 1994," an annual public library data collection collaboration between the National Center for Education Statistics (NCES), National Commission on Libraries and Information Science (NCLIS), and state library agencies. The report examines 10 Federal Information Policies: "Reaching 100% Public Library Connectivity"; "Importance of Internet-Based Services Rather than Connectivity"; "Universal Service"; "Subsidizing Public Library Connection Costs"; "Public Access to Electronic Government Information"; "Effectiveness of the Library Services and Technology Act for Public Libraries"; "Complexity of Internet-Related Costs"; "Need for a New National Data Collection Paradigm"; "Role of the Federal Government"; and "Multiple Federal Public Library Policies and Programs". In addition, nine Public Library Policy Issues are discussed: "Thinking Locally in a Global Networked Environment"; "The Endless Upgrade"; "Focus on Network-Based Services"; "Identifying, Describing, and Defining Internet-Related Costs"; "Redeploying Library Resources"; "Comprehensive Internet Costs and Statistics Management"; "Performance Measures and Statistics for Networked Services"; "Resource Sharing"; and "New Models for Learning and Applying Internet Skills." (Contains 37 references.) (JAK)

****

ED 417 719

National Commission on
Libraries and Information Science



Policy Issues & Strategies Affecting Public Libraries in the National Networked Environment:

Moving Beyond Connectivity

December 1997

John Carlo Bertot

Charles R. McClure

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Charles R. McClure

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

IR056941

U.S. National Commission on Libraries and Information Science
(NCLIS)

Jeanne Hurley Simon, Chairperson
Martha B. Gould, Vice Chair
C. E. "Abe" Abramson
Walter Anderson
James H. Billington, Librarian of Congress
(Winston Tabb, serves for the Librarian of Congress)
LeVar Burton
Joan R. Challinor
Diane B. Frankel (ex-officio)
Mary S. Furlong
José-Marie Griffiths
Frank J. Lucchino
Bobby L. Roberts
Joel D. Valdez
Robert S. Willard

The views, opinions, and recommendations expressed in this report are those of the authors and do not necessarily reflect the official position or policy of the U.S. National Commission on Libraries and Information Science.

For copies of this report, contact:

U.S. National Commission on Libraries and Information Science
1110 Vermont Avenue, N.W., Suite 820
Washington, DC 20005-3522
(202) 606-9200 phone
(202) 606-9203 fax

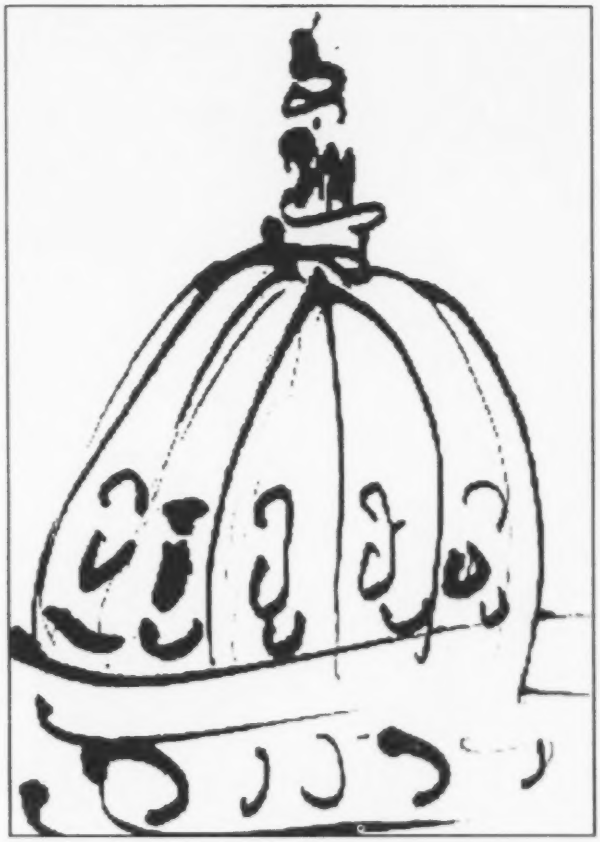
Electronic versions of this report are available at the following:

http://www.nclis.gov/

http://research.umbc.edu/~bertot/files.html

Artwork© by Agnes Amilian

National Commission on
Libraries and Information Science



Policy Issues & Strategies Affecting Public Libraries in the National Networked Environment:

Moving Beyond Connectivity

December 1997

John Carlo Bertot **Charles R. McClure**

United States
National Commission on
Libraries and Information Science

January 1998

The President
The White House
Washington, DC 20500

The Vice President
The White House
Washington, DC 20500

Dear Mr. President and Mr. Vice President:

I am pleased to present *Policy Issues & Strategies Affecting Public Libraries in the National Networked Environment*. This special report was prepared at the Commission's request to follow up on the 1997 survey of public libraries and the Internet, co-sponsored by the National Commission on Libraries and Information Science with the American Library Association. This special report also uses information from the 1994, 1995 and 1996 studies sponsored by the Commission on the same topic.

The 1997 survey (based on a sample of 1,700 of the Nation's more than 8,900 public libraries) found that more than 60% offer public access to the Internet, up from nearly 28% in 1996. However, only 13% of library systems offer access to the World Wide Web at some or all of their branch libraries. In short, the strides are noteworthy, but the gaps continue to concern us too.

This special report, *Policy Issues & Strategies Affecting Public Libraries in the National Networked Environment*, raises pertinent questions about the unequal distribution of Internet connectivity, costs and provision of service across library population of legal service areas or urban/rural status.

In the Commission's letter to the President transmitting the first public libraries/Internet survey report in June 1994, we stated,

> The Commission is concerned that public libraries offer advanced telecommunications and information services that benefit local communities. Just as they have offered open access to recorded knowledge since the earliest days of our Nation's history, public libraries have a vital role in assuring that advanced information services are universally available to all segments of the population on an equitable basis.

1110 Vermont Avenue, N.W. Suite 820
Washington, D.C. 20005-3522
(202) 606-9200
Fax: (202) 606-9203

Federal Recycling Program ⊙ Printed on Recycled Paper

We know you share our commitment to the critical role of public libraries in the networked environment, and we deeply appreciate your repeated actions and statements confirming that commitment.

This special report is transmitted to show the progress we have indeed made and the progress we still must make.

Thank you again for your continued interest in and attention to networked information services through libraries and schools for all the Nation's citizens.

Sincerely,

Jeanne Hurley Simon

Jeanne Hurley Simon
Chairperson

BEST COPY AVAILABLE

CONTENTS

INTRODUCTION 1

METHODOLOGY 2

ISSUES AND STRATEGIES 3
- Federal Information Policies 3
  - Reaching 100% Public Library Connectivity 4
  - Importance of Internet-Based Services Rather Than Connectivity 6
  - Universal Service 7
  - Subsidizing Public Library Connection Costs 8
  - Public Access to Electronic Government Information 9
  - Effectiveness of the Library Services and Technology Act for Public Libraries 11
  - Complexity of Internet-Related Costs 11
  - Need for a New National Data Collection Paradigm 12
  - Role of the Federal Government 14
  - Multiple Federal Public Library Policies and Programs 14
- Public Library Policy Issues 16
  - Thinking Locally in a Global Networked Environment 16
  - The Endless Upgrade 16
  - Focus on Network-Based Services 17
  - Identifying, Describing, and Defining Internet-Related Costs 17
  - Redeploying Library Resources 18
  - Comprehensive Internet Costs and Statistics Management 19
  - Performance Measures and Statistics for Networked Services 19
  - Resource Sharing 20
  - New Models for Learning and Applying Internet Skills 20
- Developing Public Library Networked Services 20
  - Additional Research 21
  - New Roles 21
  - Moving Beyond Connectivity 23

REFERENCES 23

ABOUT THE AUTHORS 26

FIGURES AND TABLES

Figure 1. 1994-1997 Connectivity and Projected Public Library Internet Connectivity 4
Figure 2. U.S. Population Served by Public Libraries Connected to the Internet 5
Figure 3. Connected Public Library Type of Internet 6
Table 1. Summary of Key Issues 22

INTRODUCTION

In spring 1997, the American Library Association (ALA) and National Commission on Libraries and Information Science (NCLIS) sponsored the *1997 Public Libraries and the Internet* study (hereafter referred to as the 1997 Study) (Bertot, McClure, and Fletcher, 1997). This study was the third such study, building upon the 1994 and 1996 studies sponsored by NCLIS (Bertot, McClure, and Zweizig, 1996; McClure, Bertot, and Zweizig, 1994). While the first study emphasized public library connectivity, type of connectivity, and types of library Internet uses, the second and third studies reflected a changing electronic networked policy and technical environment, and emphasized library connectivity, type of connectivity, public access service provision, and Internet-related costs.

The 1997 Study final report presents detailed data concerning public library involvement with and use of the Internet. The report includes such data as factors affecting public library involvement with the Internet; types of Internet connections and technologies; types of public library public Internet access services such as on-line databases, CD-based services, and special hardware/software for persons with disabilities; library Internet-related costs as a portion of total library information technology (IT) budgets; anticipated library Internet expenditures; and library ratings of Internet services and technologies. Readers are encouraged to review the final report, which forms a critical basis for understanding this policy paper.

The 1997 Study shows that libraries are connecting rapidly to the Internet, are providing increased public access to the Internet, and are increasingly offering electronic networked services to patrons. At present, 72.3% of public libraries have some type of Internet connection.[1] The study also shows, however, that the distribution of Internet connectivity, costs, and service provision are not equal across library population of legal service areas or urban/rural status (American Library Association, 1997).

It is important to note that public libraries will continue to connect to the Internet and provide increased public access to Internet services. Indeed, by May 1998, approximately 86% of public libraries will have an Internet connection. Moreover, those libraries will serve approximately 97% of the U.S. population. Thus, the libraries that do not plan to connect are most likely to be rural, small, and serve a small portion of the U.S. population.

On the surface, the connectivity statistics are impressive. Readers should note, however, that libraries generally disagree, across all population of legal service areas and urban/rural categories, that their public access Internet services are adequate. In particular, libraries indicate that patrons do not have adequate access to public access workstations and that those workstations are not sufficiently equipped for today's multimedia requirements.

While the public library Internet connectivity percentages are compelling, libraries that have Internet connections use predominantly dial-up technology to connect to the Internet. Although a majority of public libraries provide graphical access to the Internet, most do so over a single dedicated phone line at rates of 33.6kbps or less (a majority--49%--at 28.8kbps). For libraries that do have leased-lines, a majority--56%--still use 56kbps lines. While 27% of public libraries have T1 lines, discussions with survey respondents and author experience in other studies, indicate that most of the T1 lines are fractional, with 56kbps lines connecting library system branches to the main library's services. Thus, readers should not be surprised when responding libraries rate their Internet connections as somewhat inadequate.

Given the current policy environment of universal service as provided in the Telecom-

[1]This report references data that appear in Bertot, McClure, and Fletcher (1997).

munications Act of 1996 (TCA) (P.L. 104-104) and the Library Services and Technology Act (P.L. 104-208) (LSTA), these findings raise difficult questions that policy makers, library professionals, and researchers should consider for public library Internet service provision:

- What is universal service in the networked environment? Is it:
  - Connectivity?
  - Not just connectivity, but a certain level of connectivity?
  - Services provision over the network?
  - A combination of a certain level of connectivity *and* a level of services provision?
- Given the percentage/anticipated percentage of library Internet connectivity, has universal service been achieved for public libraries?
- What measures are necessary to assess, evaluate, and improve public library electronic networked services?
- How can public libraries better use, develop, and influence the creation of networked services to meet the needs of their communities?
- What new management strategies must libraries adopt to best meet the challenges of networked technologies?

Answers to such questions are not easy to derive. Careful consideration of these and other questions is necessary to inform policy makers and library professionals as to the best means possible to facilitate the ongoing transition of public libraries into the electronic networked environment.

This report is neither a review of the literature related to public libraries and the Internet, nor it is not a comprehensive policy analysis of federal information policies affecting public libraries. Rather, this report discusses selected issues regarding public library Internet connectivity, costs, and use. This report discusses the implications of the 1997 Study and, where possible, presents policy recommendations related to the study's findings. Overall, this report suggests the importance of federal policy and library management in considering issues beyond simply connecting to the Internet.

METHODOLOGY

The 1997 Study drew a weighted sample of 2,000 public library systems to be able to provide national estimates of public library Internet connectivity, costs, and use. The sample was stratified by five population of legal service area categories (million+, 500,000-999,999, 100,000-499,999, 25,000-99,999, 5,000-24,999, and less than 5,000) and three metropolitan status codes (CC=Central City [Urban], NC=Metropolitan Area, but not within central city limits [Suburban], NO=Not in a Metropolitan Area [Rural]).

The 1997 Study used the *Public Libraries in the United States: 1994* data, an annual public library data collection collaboration between the National Center for Education Statistics (NCES), NCLIS, and state library agencies, from which to draw the sample (NCES, 1997). This annual data collection activity produces a variety of public library-related data from all U.S. public libraries that NCES reports.

The study team based the initial draft of the survey instrument on the form used in 1996, modifying it to reflect the current Internet technology and policy environment, Internet cost factors, and public library management issues. In addition, an Advisory Board for this study provided suggestions for topics to address concerning public library involvement with the Internet. The 1997 survey incorporated key questions from the 1994 and 1996 surveys to provide longitudinal data for 1994-1996 public library Internet involvement changes. The survey instrument was pre-tested, revised, and finalized in April 1997. The final version of the survey was sent to the 2,000 public libraries in the sample during May 1997. A total of 1,426

surveys were returned, for a response rate of 71.3%. The responding library weights were recalculated to compensate for nonresponding libraries.

Readers interested in a more detailed description of the survey's methodology should refer to the 1997 Study final report.

ISSUES AND STRATEGIES

The 1997 Study provides a range of data and findings from which it is possible to identify and discuss a number of policy issues. It is possible to organize these policy issues in terms of issues related to (1) federal information policies, and (2) public libraries. The purpose of this section is to describe and discuss selected key policy issues in each of these areas and, when possible, to offer options and strategies for dealing with these issues.

The issues identified and discussed in the following sections are not exhaustive. Indeed, numerous other issues related to public libraries and the Internet deserve attention. The issues discussed here evolve directly or indirectly from the data obtained from the 1997 Study. At the federal level, information policies dealing with encryption, First Amendment rights, privacy, copyright and intellectual property rights, and censorship--to name a few--also are critically important to the development of the Internet and how public libraries can best use--both as providers and consumers of electronic resources--the Internet.

For individual public libraries, issues related to filtering access to selected Internet services and resources, promoting equal access to the Internet, planning and evaluating library IT infrastructures, developing partnerships with other organizations in the use of the Internet, and funding network technology and services--to name a few--also are critically important to the success with which the library uses the Internet and the global networked environment.

In short, there are numerous federal information policy issues and local public library issues that deserve attention, discussion, and resolution. Unfortunately, they cannot all be reviewed here. Those discussed below, however, appear to be especially important both for their long-term impacts on public libraries and for their pervasiveness in affecting the role of public libraries in the evolving global networked environment (Gore, 1995).

Federal Information Policies

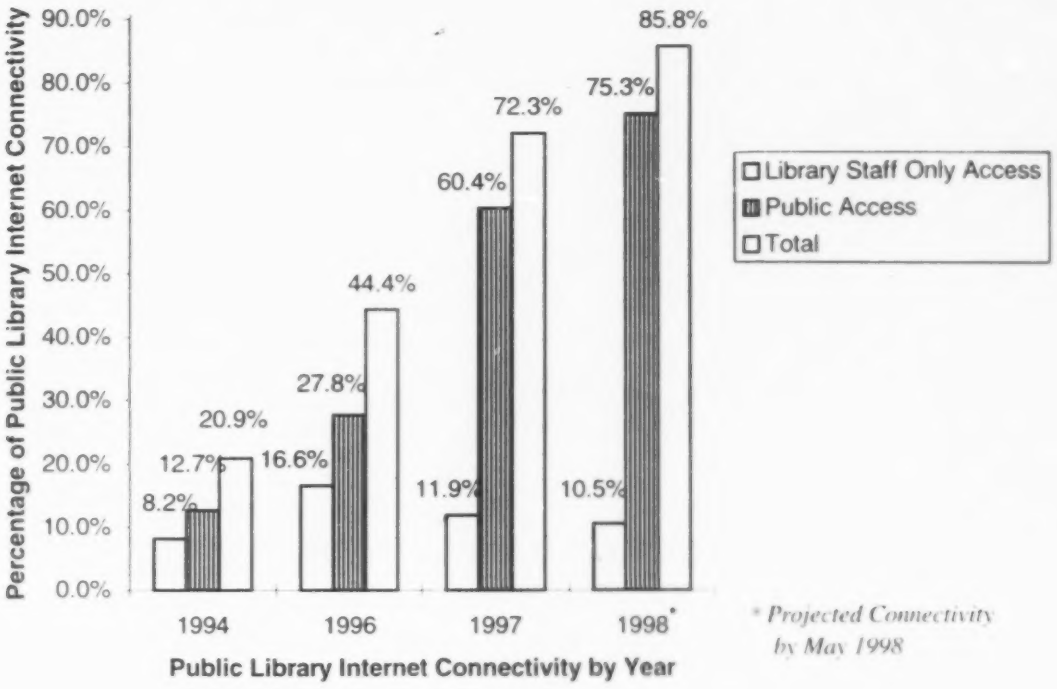
Findings from the 1997 Study suggest a number of areas in which there is a need to review and debate federal information policies as they relate to the role of public libraries in the evolving National Information Infrastructure (NII). The NII Information Infrastructure Task Force (IITF) Committee on Applications and Technology noted in a January 25, 1994, document that libraries are one of seven major application areas for the NII (IITF, 1994, p. 3):

> For education and for libraries, all teachers and students in K-12 schools and *all public libraries* [authors' emphasis]--whether in urban suburban, or rural areas; whether in rich or in poor neighborhoods--need access to the educational and library services carried on the NII. All commercial establishments and all workers must have equal access to the opportunities for electronic commerce and telecommuting provided by the NII. Finally, all citizens must have equal access to government services provided over the NII.

President Bill Clinton commented in his State of the Union address in January 23, 1997 (Clinton, 1997):

> In our schools, every classroom in America must be connected to the information superhighway, with computers and good software, and well-trained teachers. We are working with the telecommunications industry, educators, and parents to connect

Figure 1. 1994-1997 Connectivity and Projected Public Library Internet Connectivity.



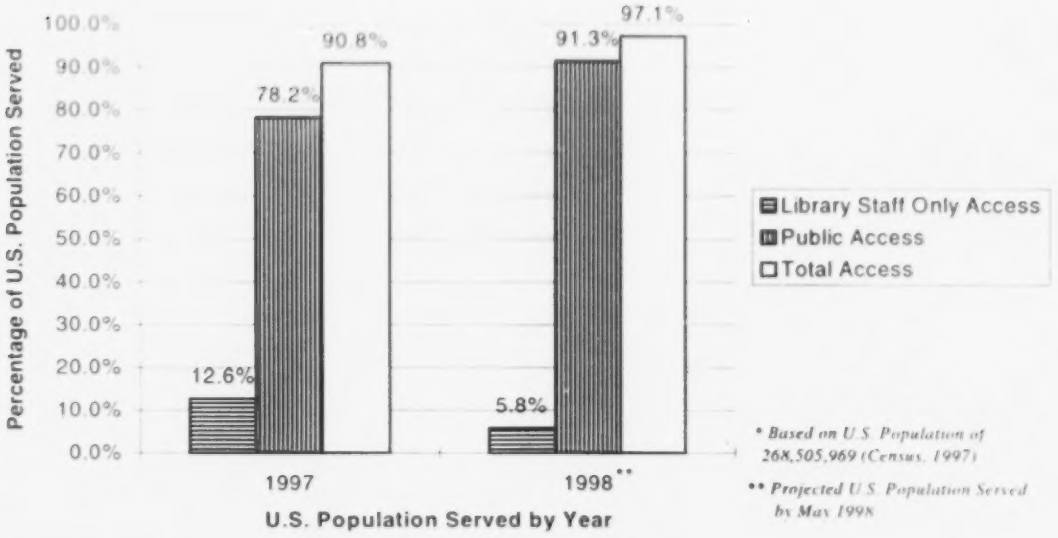
> . . . every classroom *and every library* [authors' emphasis] in the entire United States by the year 2000. I ask Congress to support this education technology initiative so that we can make sure this national partnership succeeds. must have equal access to government services provided over the NII.

The vision of *connecting* libraries and schools, while a useful first step in the NII, will not in and of itself necessarily ensure the successful *use* and *application* of the information superhighway. A range of issues other than connectivity requires attention and debate.

Reaching 100% Public Library Connectivity

As of spring 1997, 72.3% of public libraries had some type of Internet connection, as compared to 20.9% in 1994 (McClure, Bertot, and Zweizig, 1994) (see Figure 1--Figure 9 of the 1997 Study). The overall level of Internet connectivity for public libraries varies greatly, however, by the population public libraries serve, with 1997 data suggesting that public libraries in larger population areas have significantly higher rates of Internet connectivity (100% for libraries with population of legal service areas of greater than one million) than public libraries in smaller population areas (56.3% for libraries with population of legal service areas of less than 5,000). A substantial difference also exists in public library connectivity between urban libraries (86.9% for central

Figure 2. U.S. Population Served by Public Libraries Connected to the Internet.*



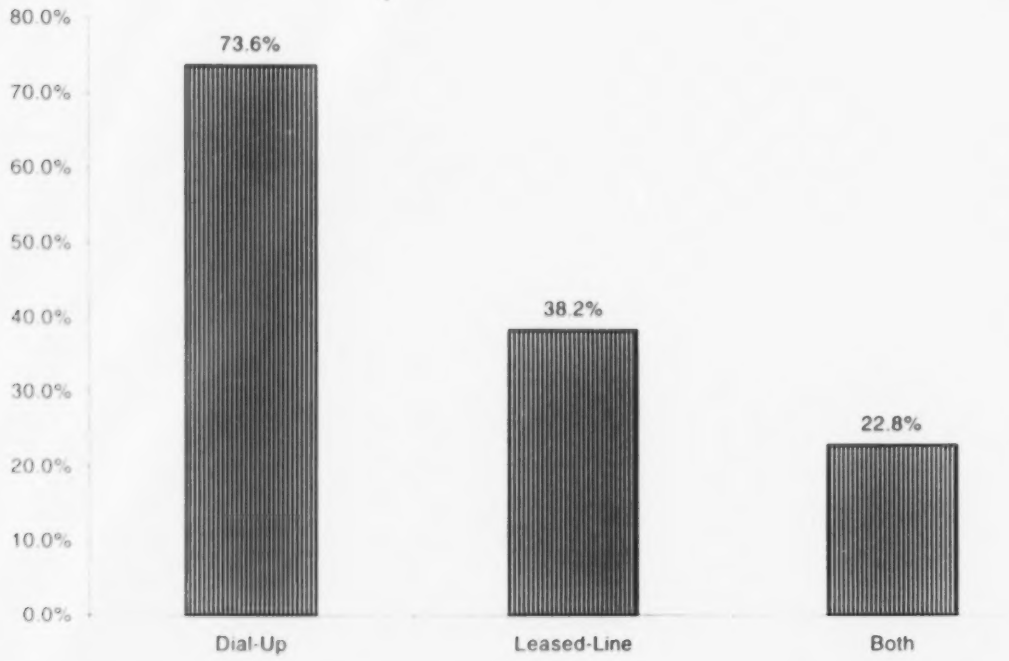
city libraries) and rural (66.0% for non-central city libraries) libraries. Thus, public library Internet connectivity is neither equal nor even throughout the nation.

The 1997 Study data projects that by spring 1998, 85.8% of all public libraries will have some type of connection to the Internet and that 75.3% of all public libraries will provide public access to the Internet (see Figure 1). By using population of legal service area data contained in the public library Universe File (NCES, 1997), an estimated 90.8% of the U.S. population is served by a connected public library (see Figure 2). Of that 90.8%, 78.2% of the U.S. population has access to a public library that provides public access to the Internet. By combining planned Internet connectivity and population data, nearly the entire nation--97.1%--should have access to a connected public library, and 91.3% should have access to a public library providing public access to the Internet by spring of 1998.[2] But at what cost and with what benefits should current and future policy continue to strive for 100% connectivity?

The 1997 Study data suggest that approximately 27.7% of public libraries that serve 9.2% of the population remain to be connected to the Internet as of May 1997 (see Figure 2--Figure 10 of the 1997 Study). The data also show that these public libraries have small communities, typically 5,000 or under, and often are located in rural areas. For a host of reasons, the costs to connect the last 27.7% of public libraries and the costs for those

[2]The 1997 Study surveyed public library systems. Key and necessary data for the future are the percentage of connected library *branches* within the approximately 16.3% of public library systems that have branches.

Figure 3. Connected Public Library Type of Internet Connection.



libraries to provide networked services are likely to be significant. At what point is it possible to say that public libraries are providing adequate connectivity to the public? at a 90% connectivity rate? when 90% of public libraries provide Web-based information resources and services? Perhaps the attention should shift now from *connectivity* to the *provision of networked services*.

Importance of Internet-Based Services Rather Than Connectivity

An important relationship exists between the type of Internet connection a public library has and its ability to provide a range of services. The 1997 Study shows that 73.6% of connected public libraries rely on dial-up modems, while only 38.2% rely on leased-line connectivity (see Figure 3--Figure 11 of the 1997 Study). Given the extent and sophistication of information resources and services now available on various websites, dial-up access simply is inadequate to provide access to that information, interactive services with other organizations, or sophisticated applications that include interactive video conferencing and extensive graphics.

As discussed elsewhere (McClure and Bertot, 1997b), public libraries exist in a range of very different environments that use multiple types of connections, receive various types of state and local assistance, work in a variety of networking consortia, and serve communities that often vary considerably from library to library. In this context, the key issue now is less the degree to which the nation's public libraries have an Internet connection, but rather the:

- Degree to which specific levels of connectivity (e.g., 28.8kbps versus a T1 leased-line) affect services development and the extent and types of Internet-based services that public libraries can provide given that connection;

- Extent to which public library Internet connectivity and Internet-based services meet community information needs;

- Means through which public library IT infrastructures are evolving, their costs, the degree to which these infrastructures integrate various electronic and networked services, and the funding mechanisms of these infrastructures; and

- Need to develop specific criteria to assess when "universal service" to the public has been accomplished as per the TCA.

The goal of 100% connectivity to the Internet by public libraries by the year 2000 may in fact be the wrong goal. Perhaps the better goal to drive national policy is that 100% of public libraries will be able to provide a range of high-quality, Internet-based *services* with high bandwidth (e.g., capable of full-motion video) that best meet the needs of their communities and best link those communities to the global information infrastructure (Gore, 1995). National goals related to "connectivity" alone may be shortsighted.

Universal Service

The TCA, the first significant legislative overhaul to the Communications Act of 1934, essentially updated a variety of key aspects of the telecommunications industry, creating a more market-driven industry that relies on competition to foster lower telecommunications rates throughout the nation (Mueller, 1997). Section 254b offers the following principles to advance universal service:

- **Quality and rates**: Quality services should be available at just, reasonable, and affordable rates.

- **Access to advanced services**: Access to advanced telecommunications and information services should be provided to all regions of the Nation.

- **Access in rural and high cost areas**: Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services . . . that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonable comparable to rates charged for similar services in urban areas.

- **Equitable and nondiscriminatory contributions**: All providers of telecommunications services should make an equitable and non-discriminatory contribution to the preservation and advancement of universal service.

- **Access to advanced telecommunications services for schools, health care, and libraries**: Elementary and secondary schools and classrooms, health care providers, and libraries should have access to advanced telecommunications services as described in subsection (h).

- **Additional principles**: Such other principles as the Federal-State Joint Board and the Commission determine are necessary and appropriate for the protection of the public interest,

convenience, and necessity and are consistent with this Act.[3]

These principles do not define the concept of "universal service." Rather, the TCA left the definition process to the Federal Communications Commission (FCC) and the Federal-State Joint Board. The notion of universal service, however, implies some baseline or minimal level of Internet *services* that the federal government assures the public it can access and use. For example, the government could assure the public that they are entitled to, minimally, professional assistance for how to use Internet-and Web-based services and obtain basic government services via the network.

Existing policy discussions of universal service--especially those from the FCC--fail to differentiate between requirements for first providing access (connectivity), and then for determining what *services*, if any, should be made universally available (Werbach, 1997). Indeed, the FCC defined universal service essentially in terms of the wiring, communications hardware, and telecommunications services (FCC, 1997). Furthermore, policy makers often fail to recognize that providing access, say a 28.8kbps dial-up from the local public library, may still not provide appropriate *services* from the public library. Moreover, the FCC does not discuss the extensiveness of connectivity--e.g., ratio of dial-up lines to users. Thus, one could consider a single dial-up line in a public library as connectivity.[4] Access to information *resources* is not provision of networked *services*.

While the specific implementation and impact of the Universal Service Fund (USF) itself on public library Internet connectivity remains unclear, it is important to note that the existence of the USF may provide unintended benefits to the public library community. Discussions by the authors with state librarians, state library staff, and public library directors indicate that the proposed telecommunications services discount structure for public libraries and schools has brought previously disparate communities--public libraries, schools, public service commissions, to name a few--together to form statewide and local connectivity strategies. This is a valuable step forward in creating a state and local collaborative process for access to and the provision of electronic networked services.

Subsidizing Public Library Connection Costs

The universal service provision of the TCA specifically directed the FCC to create a discount structure for telecommunications services for schools, libraries, and rural health care institutions (P.L. 104-104, Section 254). Based on the broad guidelines established by the TCA, the FCC issued its final universal service rulemaking in May 1997. In this ruling, the FCC created the following (Federal Communications Commission, 1997, Section X):

- $2.25 billion annual discount fund for schools and libraries; and
- Telecommunications discount structure ranging from 20%-90% for telecommunications services. The discount rate

[3] In its May 1997 ruling, the FCC and Joint Board added the principle of **Technology Neutral**. The intent of this principle is for the universal service process of the FCC and Joint Board not to promote the attainment of universal service through any particular telecommunication technologies.

[4] For example, Baltimore County Public Library in Maryland (population of legal service area of 500,000-999,999) and Lee County Library in North Carolina (population of legal service area of 25,000-99,999) would both be considered connected with a single dial-up Internet connection.

> a school or library can receive depends on the percentage of students on school lunch programs and the location (urban/rural) of the school or library.

The universal service provisions of the TCA and the FCC implementation of those provisions are aimed specifically at increasing the level of connectivity of schools and libraries to the Internet. But, as suggested above, subsidizing connectivity costs may not be the best place to support the development of Internet-based services. In addition, the 1997 Study shows that public libraries currently have a number of Internet-related costs that are paid by sources outside the library (pp. 61-63). How will the USF awards affect these existing "subsidies" that public libraries currently receive?

The "E-Rate," or education rate, is the term used to describe the subsidy that schools and libraries may request from the USF. Telecommunications carriers must now offer their lowest rates to elementary and secondary schools, and to public libraries. In addition, schools and libraries can receive an additional 20-90% discount on top of the lowest corresponding rate for telecommunications services, Internet access, and internal connections.

As this report is written in December 1997, the procedures for how schools and libraries are to obtain subsidies for connectivity costs is unclear. Updates on the implementation of the E-Rate can be found at <http://www.eratehotline.org/>. Basing these subsidies on "poverty levels" of the community served by the public library may not be an effective means to determine such subsidies. Also, there may be a need to reconsider the issue of subsidizing connectivity costs rather than some other aspect of networked services, such as the provision of local services or providing public access to and services related to Internet-based government information.

There is an ongoing policy debate as to how the USF and the Schools and Library Corporation should operate and award the funds ("OMB Approves," 1997). The process for obtaining and completing the application forms by schools and libraries may be complex and require information not easily obtained. In addition, a lawsuit filed by Southwestern Bell against the FCC alleging that requiring the Regional Bell Operating Companies (RBOCs) to contribute to the USF is illegal remains undecided (Mendels, 1997). In short, policy related to the USF and the awarding of funds to schools and libraries is ambiguous, contentious, and unlikely to be easily resolved in the near term. How much of the $2.25 billion in the USF will actually support improved school and public library connectivity remains to be seen.

Finally, the RBOCs and long distance carriers (e.g., AT&T) continue to maneuver to resist the implementation and execution of the USF. Indeed, AT&T and MCI indicated that they will pass on USF costs to the consumer through a fee on consumer long distance services (ALAWON, 1997). These tactics appear to be working, as the FCC indicated that it may reduce the USF by $750 million (leaving a total of $1.8 billion for libraries and schools) (Schiesel, 1997). Such strategies make the future of the USF uncertain at best.

Public Access to Electronic Government Information

The NII has a number of goals related to providing government information resources and services to the public (e.g., United States Advisory Council on the National Information Infrastructure, 1996). A vast array of information is available only through the government--and increasingly available via government Web sites (Notess, 1997; <http://www.law.vill.edi/Fed-Agency/fedwebloc.html>. The federal government is constructing numerous homepages in recognition of the perceived effectiveness of the Web for public access to public information. Some sites, such as the webpage that coordinates access to federal statistics <http://www.fedstats.gov> provide information that simply is unavailable elsewhere.

Web-based government information is an exceptionally rich resource for Internet users, since it presents a multimedia information format that promotes and allows a range of information access and presentation options unavailable in a print format (Wyman and McClure, 1997). The Web's popularity derives largely from this multimedia environment. A near "gold rush" mentality currently exists in federal agencies to post information and create services on the Web. Thus, public information stakeholders can expect more government information to be made available electronically and via the network--not less. Moreover, these services and information may *only* be made available electronically.

Given this environment, and the Clinton Administration's initiatives to improve the public's access to government information and services, the role of the public library to assist the public in access to this information is important. Having great expanses of networked government information and services available without a delivery system, people to provide assistance and support, and high-quality workstations and telecommunications access will have negative affects on this policy goal. The 1997 Study data show, however, that 73% of public libraries with some form of Internet connection rely on dial-up access--typically from a 28.8kbps modem.

Such connectivity is inadequate if public libraries are to serve effectively in providing public access to government information resources and services. As interactive video conferencing, color graphics, and other applications become necessary for the provision of services, high bandwidth connections at public libraries are essential. Thus, the policy issue of moving from "some connectivity" to "high bandwidth" and "adequate connectivity" takes on increased importance if public libraries are to play a significant role in the provision of electronic government information resources and services.

Public access to government information can also be enhanced with a revised and revitalized Government Printing Office (GPO) Depository Library Program (DLP). As this report is written, efforts are under way to draft new legislation to update the parts of Title 44 of the *United States Code* that deal with the GPO and the DLP. Revisions to enhance public access to government information might include:

- Preservation of the DLP, but in an electronic and networked structure that better coordinates (not necessarily centralizes) government information. An argument can be made that there is less need for 1,400 depository libraries than for fewer such libraries that are better connected with higher bandwidth and more staff.

- Providing some direct support to selected libraries--including public libraries--for providing direct access to government information resources and service. The reality is that many librarians serve as surrogate federal employees in assisting the public find government resources and use government service.

- Developing mechanisms that better coordinate agency dissemination of government information via their websites and ensure that there is some type of locator system (Moen and McClure, 1997) that can search across agency websites effectively to access the information and services on those websites.

Ultimately, the federal government has responsibilities to ensure the dissemination of and access to public information to the nation. Public libraries have an opportunity to develop more roles than those of disseminating and accessing information in the networked environment, such as supporting public use of government *services* via the Internet.

Rethinking how the DLP can best operate in this global networked environment is

essential ("Panel Reaches Accord," 1997). Equally important is for specific federal actions to enhance the role of libraries to improve the public's access to government services. Vice President Al Gore stated in *Access America: Reengineering through Information Technology* that a key policy initiative was, in fact, "Improve the Public's Access to Government Services" (Gore, 1997, pp. 5-14.) Conspicuous by its absence were specific recommendations or actions that involved public libraries in this policy initiative.

Effectiveness of The Library Services and Technology Act for Public Libraries

The impact of LSTA (P.L. 104-208) on public libraries and their transition to the global networked environment is unclear. LSTA, signed into law on September 30, 1996, marked a change in the direction of federally funded library initiatives from that of its predecessor the Library Services and Construction Act (LSCA) in several key ways:

- LSTA consolidates portions of the Higher Education Act that related to a variety of national level library needs;
- LSTA is now administered by the Institute for Museum and Library Services (IMLS);
- LSTA applies to nearly all types of libraries, not just public libraries;
- LSTA increases the emphasis on electronic networking activities, and
- LSTA requires states to evaluate and report on the impact of LSTA-funded initiatives.

Taken together, these key components of LSTA create a new federal-state-library funding environment that emphasizes collaboration, performance, and technological innovation.

As this report is being written, the IMLS has proposed draft guidelines for 1998 National Leadership Grants, which may be accessed at <http://www.ims.fed.us/guidelines/natlead.pdf>. Subtle but important differences are evident between the funding guidelines proposed by IMLS and those traditionally produced under the LSCA. Since funds made available through LSTA and the National Leadership Grants will have an important impact as a catalyst to move public libraries (and other organizations) into the networked environment, the final version of these guidelines is an important policy issue. Equally important will be to review and assess what organizations actually received what types of awards as a result of this new program.

Given the debate and effort that went into the development of LSTA, it is still too early to determine how this act will help accomplish Clinton Administration goals related to promoting the role of public libraries in the NII. There is a need to develop efforts, however, to monitor carefully the guidelines for IMLS' distribution of grants, the kinds of grants that are funded, the extent to which public libraries are successful in this grant competition, and an overall evaluation of the degree to which LSTA goals are, in fact, accomplished.

Complexity of Internet-Related Costs

As indicated in this report and the 1997 Study final report, determining the costs of library Internet services is complicated at best. While numerous reasons exist for this complexity, three critical reasons are that (1) a library uses the same equipment to provide multiple services (e.g., a library workstation can provide users with access to the library's catalog as well as the Internet); (2) libraries connect to the Internet through multiple and varied arrangements (e.g., through regional consortia, a statewide network, and/or both); and (3) for political reasons, some costs are hidden, charged against other agencies, or simply not reported.

This situation will only continue to increase in complexity. Federal, state, and local funding and connectivity programs are specifically

encouraging and promoting collaborative, cost-sharing, and cross-agency approaches to building the NII. It will become increasingly difficult, therefore, to determine exactly who or what is responsible for what parts of a network, its services, or its costs. Moreover, conversations with study participants indicate that such accountability may not be of interest to librarians, since the services are seamless and the costs for the services do not appear on the library's budget.

The lack of clear and reasonably precise cost data, however, means that studies such as the 1997 Study will more than likely *under report* the actual cost of national public library connectivity. This lack of accurate library cost data may affect the determination of the size and continuation of the USF and other policy initiatives that affect the role of public libraries in the global networked environment.

Need for a New National Data Collection Paradigm

Although information on connectivity, use, and costs--as reported in the 1997 Study--are important, policy makers and the public library community may need to reassess the types of national data that will be required in the future to continue the discussion of the role of public libraries in the NII and the evolving global networked environment.

Current longitudinal national data collection efforts for public libraries and the electronic networked environment are irregular, funded on an ad-hoc basis, and tend to collect data that reflect the ability and willingness of libraries essentially to count and "check off" various electronic services (Bertot, McClure, and Fletcher, 1997; Bertot, McClure, and Zweizig, 1996; McClure, Bertot, and Zweizig, 1994). These data include:

- Type and level of Internet connection;
- Types, capabilities, and location of public access workstations;
- Types and availability of publicly available network-based services, such as databases, Web access, and remote dial-in capabilities;
- Internet/network services costs and payment responsibilities (e.g., who pays for those services); and
- Factors affecting Internet connectivity (e.g., costs).

The networked environment, however, is much more complex than such data collection activities reflect. Indeed, research by the authors (Bertot and McClure, 1996) shows that a network is a multi-dimensional entity that encompasses minimally the following:

- **Technical infrastructure**: The hardware, software, equipment, communication lines, and technical aspects of the network;
- **Information content**: The information resources available on the network;
- **Information services**: The activities in which users can engage and the services that users may use to complete various tasks;
- **Support**: The assistance and support services provided to help users better use the network; and
- **Management**: The human resources, governance, planning, and fiscal aspects of the network.

Data collection activities, therefore, must begin to reflect this multi-dimensionality of electronic networks.

Rather than solely concentrating on the technical infrastructure and services aspects of a network, as do current data collection activities, there is a need to collect data that begins to describe network services and content using a new data collection paradigm. This

paradigm might include data to produce measures such as:

- **Extensiveness**. How much of the service has been provided (e.g., number of users logging-in per week on a Web page, or the number of participants of a particular listserv);
- **Efficiency**. The use of resources in providing or accessing networked information services (e.g., cost per session in providing access to remote users of an on-line catalog, or average time required to successfully telnet to a remote database);
- **Effectiveness**. How well the networked information service met the objectives of the provider or the user (e.g., success rate of identifying and accessing the information needed by the user);
- **Service quality**. How well a service or activity is done (e.g., percentage of transactions in which users acquire the information they need);
- **Impact**. How a service made a difference in some other activity or situation (e.g., the degree to which network users enhanced their ability to gain employment or pursue business);
- **Usefulness**. The degree to which the services are useful or appropriate for individual users (e.g., percentage of services of interest to different types of user audiences); and
- **Adoption**. The extent to which institutions or users integrate and adopt electronic networked resources or services into organizational or individual activities (e.g., classroom instruction).

The adoption of a new data collection paradigm will provide policy makers, library professionals, and researchers with the ability to begin formulating answers to more difficult questions, such as the relationships between Internet and network-based expenditures and levels of service; the relationship between various connectivity models and the levels of network services; the impact of network-based resources on users of the network; the impact of funding and other policy initiatives on connectivity; and the development of network performance measures.

Such a change in data collection activities will not come easily, however. Several issues require resolution for there to be a new public library data collection stream:

- What variables/data elements are most appropriate, measurable, and possible to collect from public libraries?
- Who should collect and report the data?
  - NCES, through the annual Federal-State Cooperative System public library data collection process?
  - A consortium that would include various library-related organizations and researchers (e.g., the American Library Association, NCLIS, Chief Officers of State Library Agencies, Urban Library Council, and the Gates Library Foundation?
- What methodologies are appropriate for the collection of various data?
  - Surveys?
  - Case studies?
  - Focus groups/interviews?
  - A combination of some or all the above, as well as other methodologies?

Resolution of these issues is critical to the continuation and expansion of public library electronic network measures.

Failure to grapple with measuring the networked environment as it pertains to library services will leave libraries without the ability to describe, document, and disseminate the uses and impacts of electronic library services to policy makers and sources of funding. Moreover, not adopting electronic data collection activities into regular data collection vehicles will create a national public library data void in an important and emerging area of public library services.

Role of the Federal Government

The federal government can take a much more active stance in supporting and coordinating policies and programs to enhance the role of libraries--and especially public libraries--in providing public access to the Internet. A number of themes should drive that support:

- Access to and use of the Internet is a tool that empowers the public and provides numerous benefits for individuals, communities, and society at large. Public libraries can serve both as a place of first resort--a community Internet resource center--and a place of last resort--a safety net--in providing public access to the Internet for the nation.

- Library access to and use of the Internet still varies widely based on geographical location, type of library, user characteristics, technical infrastructure available, and a range of other factors. A flexible and dynamic policy system is needed to respond to these various access needs. Support for connectivity alone is not enough.

- Market forces, on their own, will not provide equal access to the Internet. Without assistance, many public institutions such as schools, libraries, hospitals will encounter too many barriers to realize successfully the full potential of the resources and services available over the Internet.

- A clearly articulated connectivity agenda and direction formed through discussion, policies, and assistance to public libraries that promote a certain *minimal* level of connectivity and networked services capabilities.

- Partnerships among and between the federal government, the library community, information providers, local and state governments, and other institutions/organizations are essential to increase access to the Internet. The recent commitment by the Gates Library Foundation <http://www.glf.org> to enhance the role of public libraries in the networked environment is an excellent example of how such partnerships can assist not only public libraries but society overall.

- A policy and program framework (e.g, LSTA) that assists libraries and other organizations create, maintain, and expand Internet access and use programs.

Libraries are especially well suited to advance the national objectives for the NII and information superhighway as identified by Congress and the Administration (McLoughlin, 1997). Much can be done to enhance libraries' role in this evolving networked environment so that the citizenry of this country can be empowered in both their professional and personal lives.

Multiple Federal Public Library Policies and Programs

As suggested earlier in this report, the success of LSTA is unclear at this point, despite the fact that the LSTA programs are a major policy initiative and change in support for libraries in general and public libraries in particular. But a number of other federal

programs are supported by other policies that affect public libraries, such as the:

- FCC's USF and its anticipated award of some $2.25 billion to schools and libraries to support telecommunications costs <http://www.fcc.gov>;

- National Telecommunications and Information Agency Telecommunications and Information Infrastructure Assistance Program <http://www.ntia.doc.gov>;

- Department of Education has a raft of programs and services that could support libraries' development onto the Internet; these result from the Elementary School Education Act, Goals 2000, The President's Initiative on Educational Technology (U.S. Department of Education, 1997)--to name but a few <http://www.ed.gov/Technology/>;

- National Science Foundation offers a large number of programs, including support for digital libraries projects <www.nsf.gov>; and

- GPO, in its administration of the DLP, supports the dissemination of electronic government information to some 1,400 libraries <http://www.gpo.gov>.

In addition, other federal agencies have developed programs intended to support libraries access to and use of electronic information, such as the National Technical Information Service's FedWorld. The national libraries--the Library of Congress, the National Library of Medicine, and the National Agriculture Library--have programs and roles in this area. Still others, such as NCLIS, the IMLS, and the IITF of the NII provide regulatory or advisory functions related to libraries and the Internet.

This multiple-program environment has resulted in conflicting program goals and objectives. This reduces the overall effectiveness of the limited resources available to support library development onto the global networked environment, thus creating artificial walls between and among programs and agencies (i.e., resultant stovepipe programs at the local level, limited coordination of these programs across agencies, and confusion in both the federal and the library community as to what programs are appropriate for what types of libraries in particular circumstances). Furthermore, many of the programs provide competitive grants in which some libraries--especially smaller libraries in rural settings--are unable, for a host of reasons, to compete successfully against other applicants.

A comprehensive assessment and policy review of these various federal efforts to support public libraries should be conducted. To a large degree, policy makers and the library community have little evidence of the factors that contribute to the success of one program or the other. For example, an assessment of the policy providing support to schools and libraries through the USF might ask questions such as:

- Which types of schools and libraries received what amounts of money?

- What types of connectivity did schools and libraries use their awards to obtain?

- Did the awards raise the level *and* extensiveness of school and library connectivity?

- What types of connection costs were required by Internet service providers (ISPs) for schools and libraries obtaining awards?

- Did the awards assist schools and libraries to provide new or innovative services?

Such questions only begin to address issues related to the overall effectiveness and impact of the USF. Similar evaluation questions can

BEST COPY AVAILABLE

be posed for other programs as identified above. But in the era of the Government Performance Results Act (P.L. 103-62), which requires performance measures and assessment for government programs such as these library programs, a comprehensive, *cross-agency* assessment of library programs and policies would be much more useful than a handful of agency-based assessments.

Public Library Policy Issues

In addition to policy issues of particular concern at the federal level, other policy issues are best considered as the primary responsibility of public libraries and the public library professional community to resolve. Data from the 1997 Study suggest a number of topics and some possible strategies that require attention if public libraries are to make a successful transition into the global networked environment.

Thinking Locally in a Global Networked Environment

Public librarians increasingly will be forced to face and resolve a dilemma. On one hand, the networked information environment allows the library to obtain information and services from around the world. The library also must compete and provide services in this global information market. On the other hand, the traditional "market" of the library has been its local community or legal service area as determined largely by the geographical boundaries of its funding body. Issues regarding exactly who, or what, is the public library's "community" in the global networked environment are complex. To what degree, for example, is the funding of a public library's website that supports global access and use the responsibility of the community where the website is maintained, rather than the users-at-large that make use of the site?

Clearly, the prime directive for most public libraries will be to serve the community that provides the library's funding. But the library's competitors in the global networked environment are under no such constraint. Thus, public libraries will need to operate in a global networked environment with locally based funding--unless they develop revenue-producing strategies for services delivery outside their local, geographically constrained market. This dilemma will likely force libraries to re-think who or what is their community, what networked services to provide to this community, and how users of library services outside the legal funding jurisdiction should pay for their use of public library networked services.

The Endless Upgrade

One-shot fixes for IT in public libraries is not a viable policy strategy. Public libraries wishing to provide high-quality networked services to their communities will need to develop a rational strategy and budget for the purchase, installation, maintenance, and replacement of IT. Data from the 1997 Study show that respondents assessed cost factors as most important in affecting their overall involvement in the Internet. Conversations with a number of study respondents confirm that many public libraries have yet to recognize adequately the ongoing nature of IT costs and to develop funding strategies to support those costs.

Some state libraries may wish to reevaluate their policies of providing "start-up" workstations and connectivity to public libraries as a means of encouraging them to "get connected" and provide networked services. Research completed by the authors in another study (McClure and Bertot, 1997a) suggests that a number of public libraries participating in such a program will not be able to obtain local support for such upgrades in the future and will continue to rely on "state aid" or outside grants for IT upgrades. Perhaps the endless upgrade for public libraries' technology investments should be seen as a combined federal, state, and local responsibility.

BEST COPY AVAILABLE

Focus on Network-Based Services

While it is important to stress the significant increases in the percentage of public libraries that have some type of Internet connection, the 1997 Study also suggests that a relatively low percentage of libraries provide Internet-based services. For example, the data show that overall, 10.4% of public libraries have a Web server, and only 18.5% of public libraries provide dial-in access to library services. These percentages increase dramatically for the larger urban and suburban areas, but overall, these numbers suggest relatively modest provision of *services* by public libraries over the Internet.

Libraries without Web servers with relevant and desirable content or "dial-in" access services for its community will be severely handicapped as they co-exist with other content-providing ISPs. The range and sophistication of services and products provided by these ISPs, particularly those that own and provide original content (e.g., America OnLine), compared to those services offered by public libraries, is impressive. Thus, some of the key issues for public libraries in this area are:

- Must the public library compete with the ISPs for users and services? If it does not compete, will overall public library use decline?
- What network-based services and resources can a nationally organized consortia of public libraries provide, rather than each library going it alone?
- Rather than compete with ISPs, should public libraries create, maintain, and point to electronic resources that are unavailable elsewhere to the public?
- What network-based services are most important and appropriate for a particular public library?
- What planning and evaluation strategies are appropriate to satisfy library and USF requirements?
- What value-added services can the public library provide in terms of organizing or accessing other ISP services so that the library is not marginalized?

Recognition that the public library now must compete in the broader networked information environment for provision of resources and services requires a range of new and innovative strategies.

Identifying, Describing, and Defining Internet-Related Costs

The case study reported in Appendix A of the 1997 Study demonstrates the difficulties related to identifying, describing, and defining cost data and categories related to public library use of the Internet in a networked environment. That work builds upon previous efforts by the authors (McClure, Bertot, and Beachboard, 1995) to better identify, describe, and define Internet costs in public libraries. While considerable difficulties are related to this effort, the importance and usefulness of such data for local planning and for national policy making related to the role of public libraries in the NII continues to have significant impact.

An important contribution arising from that effort is increasing awareness of the difficulties and issues associated with identifying, describing, and defining Internet-related costs for public libraries. Internet-related costs for public libraries are likely to increase as a percentage of the overall library expenditures in the near term. Thus, issues of identifying, describing, and defining those costs are not likely to go away any time soon.

A key issue, however, is the importance of public libraries being able to identify, describe, and define *their* Internet-related costs. Currently, most public libraries are unable to describe these costs accurately, or to track them over time, and thus are unable to *manage* these costs effectively. Public libraries can use the cost worksheets developed from the case study

BEST COPY AVAILABLE

(see Bertot, McClure, and Fletcher, 1997, Appendix A) as a *first step* in identifying, describing, and defining costs and cost categories at their libraries. Indeed, the process of individualizing the worksheet to a particular library will provide significant insights about library Internet service costs for staff at that library.

Redeploying Library Resources

Data from the 1997 Study suggest that typically, a public library spent about 45-50% of its IT budget on Internet-related costs (see Figure 37 of the final report). This is up significantly from 1996 when the percentage of Internet costs of the typical IT budget was in the 30-40% range (Bertot, McClure, and Zweizig, 1996, pp. 24-26 [Note: based on recalculation of 1996 data in Figures 16 and 17]). But the 1997 Study data also reveal a number of interesting trends related to *anticipated* increases in certain types of Internet costs (see Figures 38 through 48 of the final report). For the second year, libraries generally anticipate increases in expenditures for the next year in:

- Hardware;
- Software;
- Telecommunications fees;
- Facilities upgrades;
- Training;
- Content and resource development;
- Program planning and management;
- Staffing; and
- Maintenance.

Indeed, in the areas of facilities upgrades, training, staffing, and maintenance, a significant number of respondents anticipate expenditure increases of *more than 5%*. While the survey indicates a range of difficulties in defining and describing appropriate Internet cost categories, the findings clearly suggest that overall costs for Internet-related expenditures (1) continue to increase relative to all IT expenditures, and (2) are likely to continue to increase as a percentage not only of the IT budget, but probably relative to all library expenditures.

A key issue for library administrators, then, is that if overall library budgets are generally stagnant or increasing only marginally, how will existing resources be redeployed to cover these anticipated increases for a range of Internet costs? These data, as well as conversations with a number of public library directors, suggest that many public libraries are being "squeezed" to support new expenditures for the transition into the global networked environment while also maintaining existing, traditional, public library services.

Redeploying existing resources may require many public libraries to rethink, reengineer, and rank programs and services in light of this evolving networked information environment (Benton Foundation, 1997). For example, it may be much less costly to license access to an information service or product through a local consortia than it is to continue to buy the product or service directly from the vendor. Or, it may be less expensive to obtain the product or service in an electronic format than in print. Story hour to all branches of the library system may be less costly and cover more users via interactive video conferencing than via traditional means. Issues related to how best to redeploy resources ultimately will depend on a range of local and situational factors. But such issues will require careful attention by public librarians and policy makers.

Comprehensive Internet Costs and Statistics Management

Describing and defining Internet-related costs will become increasingly important as libraries continue to increase the range of services they provide via the network. These

BEST COPY AVAILABLE

costs must be integrated into the overall costing and budgeting process of the library through its management information system or its decision support system. Regardless of the approach taken, comprehensive management of library costs is essential for successful planning and evaluation of library services.

The cost worksheets proposed in the 1997 Study (see the 1997 Study, Appendix A) is a beginning model that public libraries can use initially to describe basic Internet costs. But at least in the near future, individual libraries will have to customize these worksheets to take into consideration the idiosyncratic nature of each library's particular situation, its political environment, and the manner in which it obtains Internet connectivity from its ISP or consortium. It may be less important *how* the library describes and defines its costs than it is to *agree* on a set of definitions and categories that the library can track longitudinally.

Performance Measures and Statistics for Networked Services

Many public libraries are only beginning to consider how to keep statistics related to Internet use and services. Libraries that provide a range of Web services or other network-based services note that circulation, in-house reference transactions, and other traditional statistics of use are stagnant or decreasing. In most cases, electronic services counts are also rising. Thus, in order to have an accurate picture of library use, libraries will need to maintain statistics related to use of Internet services and resources.

For example, it is possible to use the logs on Web servers to track the number of times users "hit" specific types of networked services. It is also possible to use log server analysis to track patterns and Internet Protocol (IP) addresses that provide a general sense of who is using what type of services. Libraries that provide electronic reference services will also need to keep statistics of such use or conduct regular surveys to be able to track and document such uses. To a large degree, issues related to how best to identify, collect, and analyze data to produce statistics of electronic or networked information services are only now being discussed and defined.

A key policy issue for public librarians is how to assess the overall quality and impact of networked services. As Smith and Rowland (1997) state, however:

> Identifying meaningful outputs to measure the use of electronic resources and networks by public library patrons is the holy grail of current library measurement and evaluation. As library services and collections migrate from traditional print-based resources to an electronic environment, such time-honored output measures as circulation per capita, reference transactions per capita, and title fill-rate, tell only part of the story of library use volume (p. 168).

Equally important is to compare the quality and costs of traditional types of library services (e.g., in-person reference, versus email-based reference services). Some initial research conducted in this area indicates that such measures are possible, but that some effort, thought, and new types of data collection techniques--such as log server analysis--may be needed (Bertot et al., 1997).

To a large degree, public librarians, researchers, and policy makers do not understand the linkages between Internet costs and the quality and type of Internet services that are possible given a specific level of costs. Clearly, low bandwidth will limit the types of networked services that a library can provide. But the degree to which other cost factors directly affect quality and type of services provision is unclear. Costing Internet-based services and comparing such services costs to more traditional services costs will continue to be an important area for future research.

BEST COPY AVAILABLE

Resource Sharing

The difficulty in identifying Internet costs for public libraries, on the one hand, is a tribute in some cases to very successful state and regional resource sharing. A number of very different models of resource sharing in the networked environment are under development (NCLIS, 1994). The cost study indicates the importance of resource sharing as a means for reducing overall networking costs for an individual library. Evidence from the 1997 Study suggests that important economies of scale are possible for those libraries participating in statewide or regional/local networks in lowering overall Internet costs. A better understanding of these economies of scale is essential for "next steps" and innovative models for statewide, regional, and local resource sharing.

On the other hand, policy and management issues for these consortia, as well as individual public libraries, abound. Despite the fact that findings from the 1997 Study suggest that unique situational factors can affect the overall success of these consortia, resource-sharing efforts among community organizations deserve greater attention. Thought should be given to how the public library--in conjunction with local schools, government, and other organizations--can share the costs for network connectivity and services. Developing partnerships and new models for resource sharing among community organizations for technology development continues to be an important issue for public libraries (Boughman and Curry, 1997).

New Models for Learning and Applying Internet Skills

The public library community will need to rethink traditional models of training and continuing education. The expanse of knowledge needed for effective operation in the global networked environment can be intimidating. Endless topics in networking, telecommunications, IT planning and deployment, evolving technologies such as interactive video, and many more require some knowledge on the part of librarians. Not only must librarians gain knowledge in these areas, but they must be able to apply it and add value to these technologies in such ways that library services enhance and support community information services.

If training efforts continue to be one-shot, single-topic, after-the-fact events, librarians are likely to continue to be behind the knowledge curve on surviving and flourishing in the networked environment. A model that relies on and rewards individual ongoing learning--where librarians see themselves in a constant learning environment and regularly obtain knowledge and experiment in a "hands-on" context--is needed. Moreover, new models must incorporate the new technologies as the context within which the learning occurs.

Library administrators simply must invest in the library's human resources and support not only ongoing learning but the development of critical thinking skills (Meltzer and Palau, 1996). Critical thinking skills include the ability to obtain information and apply it in new ways to solve problems--especially in new environments such as the Internet. In the global networked environment, librarians will need to possess the ability to identify and solve problems in real time and across multiple tasks and activities. Partnerships among vendors, ISPs, state libraries, local community groups, government, and others will be needed if such new models are to be developed and succeed.

Developing Public Library Networked Services

The current policy climate in Washington, D.C. encourages "helping yourself," providing limited seed money to demonstrate projects with transferable methods, and leveraging awards to encourage local and private partnerships. The federal government alone cannot ensure that public libraries provide innovative networked information services, promote network literacy, insure the public's access to electronic government information,

BEST COPY AVAILABLE

and increase public access to the Internet via the nation's libraries.

Federal policy makers can, however, provide incentives and offer a range of encouragements for the library community, the public, state and local communities, and the private sector to work together toward the policy goal of supporting libraries to provide a range of networked information and services that promotes the public's personal and work-related productivity. Federal policy makers and the public library community can also continue a dialogue to discuss and resolve the issues identified in this report and summarized in Table 1.

Additional Research

The 1994, 1996, and 1997 *Public Library and the Internet* studies provided policy makers, library professionals, and researchers with previously unavailable and longitudinal data concerning public library involvement with and use of the Internet. These data serve a variety of purposes, including providing baseline library connectivity, connection and cost data, as well as information on connectivity and connection progress.

The studies, however, have their limitations. It is necessary to expand both the types of data collected and the entities from which the data are collected. For example, the various *Internet* studies collected Internet-related data from public library *systems*, not branches. While only approximately 16.3% of public library systems have branches (NCES, 1997), those systems that do have branches represent significant demographic characteristics and population sizes that need further study. Such libraries--Los Angeles Public Library, New York Public Library, Chicago Public Library, to name a few--serve large U.S. population segments of varied socio-economic backgrounds. While the studies indicate that these library *systems* have some type of Internet connection, the studies do not provide data concerning the percentage of system *branches* that have Internet connections or the type of Internet connection(s) within those branches. Moreover, no data are available that correlate various population demographics (e.g., poverty) to branch connectivity.

NCLIS, ALA, the Gates Library Foundation, and other groups indicate an interest in such additional data collection. These data are critical to assisting policy makers, library professionals, and funding agencies to:

- Determine the critical needs areas for electronic network funding;
- Measure the impact of various networking funding efforts (e.g., USF, Gates Library Foundation grants); and
- Inform the policy debate for future networking funding initiatives.

A collaborative data collection effort among federal and state library agencies (e.g., IMLS, NCLIS, and state libraries), library professional organizations (e.g., ALA), and other funding organizations (e.g., Gates Library Foundation <http://www.glf.org>) is necessary to pool limited resources and begin laying the foundation for ongoing and additional public library electronic network-related studies.

New Roles

New roles for public libraries in the evolving networked environment are still being developed (McClure, Bertot, and Beachboard 1996). But clearly, the *electronic* public library in the global networked environment has the potential to be a community resource center--with the term community being defined very differently than in traditional use (Marcum, 1996). These roles might be to:

- Introduce new information technologies to the community;

BEST COPY AVAILABLE

Table 1. Summary of Key Issues.	
Federal Policy Issues	**Public Library Issues**
Reaching 100% public library connectivity	Thinking locally in a global networked environment
Importance of Internet-based services rather than connectivity	The endless upgrade
Universal service	Focus on network-based services
Subsidizing public library connection costs	Identifying, describing, and defining Internet-related costs
Public access to electronic government information	Redeploying library resources
Effectiveness of the Library Services and Technology Act for public libraries	Comprehensive Internet costs and statistics management
Complexity of Internet-related costs	Performance measures and statistics for networked services
Need for a new national data collection paradigm	Resource sharing
Role of the federal government	New models for learning and applying Internet skills
Multiple federal public library policies and programs	

- Demonstrate applications and uses of networking for education, life-long learning, economic development, telemedicine, and a range of other applications;
- Be a local access point for a range of government information resources and services;
- Create, maintain, and organize electronic community information;
- Provide public access interactive video conferencing for the public to conduct a range of activities, including electronic commerce and interaction with state, local, and federal government;
- Equalize access such that all members of the local community can realize the benefits from "being connected" to the global networked environment;

BEST COPY AVAILABLE

- Provide training to community residents on how to use the Internet and interact successfully with a range of services provided via the net;

- Promote collaboration among schools, local governments, and other community groups to use the Internet; and

- Expand the range and types of resources and services provided from public library websites.

While the library can also serve as a safety net, a place of last resort to access and use the global information network, its greatest potential lies in serving as a place of *first* resort to access and use the Internet.

Electronic resources of all types and forms would be publicly available for those who cannot connect from the home or workplace. Librarians and educators would serve as electronic intermediaries, navigators, and instructors--being actively involved in assisting people to best use the network. Parents, students, adult learners, educators, and others could work interactively and inter-dependently on projects and activities that we can only begin to imagine now. The library, as a nonpartisan and publicly supported institution with strong local community ties, is well suited to serve in this role. A major role for public libraries, however, and the larger education community in the networked society, is to reduce socio-economic gaps in being able to tap the full potential of the network and to provide equal opportunity to networked services and resources that are available to the public.

Moving Beyond Connectivity

Increasingly, the success of the nation will depend on the degree to which the public interacts effectively in the networked environment. Network literacy--the ability to obtain services and resources, conduct business, and enhance life activities via the networked environment--is an essential element for taking advantage of the network. Indeed, evidence suggests that those members of society who are best connected and most frequently use the new information technologies are those that typically are more involved in the political process, most likely to vote, most civic minded, and most likely to support democratic institutions (Katz, 1997). Being "well connected" to the network implies knowledge, skills, and a literacy well beyond that a 28.8kbps modem connection can provide.

Thus, to some degree, the public library must now move beyond concerns related to connectivity and work with policy makers, local organizations, and others to (1) obtain high-quality connectivity with high bandwidth, and (2) develop applications and a range of value-added services in the networked environment that specifically meet the needs of the library's community of users. While the federal government can provide some support for public libraries to accomplish these goals, local public libraries will have to develop strategies and visions that are most appropriate for their particular setting. Such strategies might best be accomplished in partnership among government, the private sector, other organizations, and public libraries.

REFERENCES

ALAWON. (December 8, 1997). Action alert: 11th hour assaults on library/school telecom discounts. Washington, D.C.: American Library Association Washington Office. Available: <http://www.ala.org/washoff/alawon>.

American Library Association. (1997). *The 1997 national survey of U.S. Public Libraries and the Internet: Summary results*. Washington, D.C.: American Library Association Office for Information Technology Policy. Available: <http://www.ala.org/oitp/research/ pl97sum.pdf>.

Benton Foundation. (1997). *Buildings, books, and bytes: Libraries and communities in the digital age*. Washington, D.C.: Benton Foundation.

Bertot, J. C., and McClure, C. R. (1996). *Sailor network assessment final report: Findings and future Sailor network development*. Baltimore, Md.: Maryland State Department of Education, Division of Library and Development Services. Available: <http://research.umbc.edu/~bertot/sailor.final.report.pdf>.

Bertot, J. C., McClure, C. R., and Fletcher, P. D. (1997). *The 1997 national survey of U.S. public libraries and the Internet: Final report*. Washington, D.C.: American Library Association Office for Information Technology Policy.

Bertot, J. C., McClure, C. R., and Zweizig, D. L. (1996). *The 1996 national survey of public libraries and the Internet: Progress and Issues*. Washington, D.C.: National Commission on Libraries and Information Science.

Bertot, J. C., McClure, C. R., Moen, W. E., and Rubin, J. R. (1997). Web usage statistics: Measurement issues and analytical techniques. *Government Information Quarterly* 14 (4): 373-96.

Boughman, S. A., and Curry, E. A. (1997). *Strategic planning for library multitype cooperatives: Samples and examples*. Chicago, Il.: American Library Association.

Clinton, W. J. (January 23, 1997). Address before a joint session of the Congress on the State of the Union. *Weekly Compilation of Presidential Documents* 32 (4): 90-98.

Federal Communications Commission. (1997). *Report & order in the matter of Federal-State Joint Board on Universal Service*. Washington, D.C.: Federal Communications Commission [FCC 97-157]. Available: <http://www.fcc.gov/ccb/universal_service/fcc97157/>.

Gore, A. (1995). *Global information infrastructure: Agenda for cooperation*. Washington, D.C.: Government Printing Office.

_____. (1997). *Access America: Reengineering through information technology*. Washington, D.C.: National Performance Review and Government Information Technology Services Board.

Information Infrastructure Task Force. (1994). *What it takes to make it happen: Key issues for applications of the National Information Infrastructure*. Washington, D.C.: Department of Commerce.

Katz, J. (1997). The digital citizen. *Wired* 5 (December): 68-82, 274-5.

Lynch, C. (1995). Future Roles of libraries in citizen access to information resources through the National Information Infrastructure. *The changing nature of telecommunications/information infrastructure*. Washington, D.C.: National Academy Press: 86-97.

McClure, C. R., and Bertot, J. C. (1997a). *Evaluation of the Online at PA Libraries project: Public access to the Internet through public libraries*. Harrisburg, PA: Office of Commonwealth Libraries.

McClure, C. R., and Bertot, J. C. (1997b). Creating a future for public libraries: Diverse strategies for a diverse nation. *Library Trends* 46 (Summer): 36-51.

McClure, C. R., Bertot, J. C., and Beachboard, J. C. (1995). *Internet costs and cost models for public libraries*. Washington, D.C.: National Commission on Libraries and Information Science.

McClure, C. R., Bertot, J. C., and Beachboard, J. C. (1996). Enhancing the role of public libraries in the National Information Infrastructure. *Public Libraries* 35 (July-August): 232-8.

McClure, C. R., Bertot, J. C., and Zweizig, D. L. (1994). *Public libraries and the Internet: Study results, policy issues, and recommendations*. Washington, D.C.: National Commission on Libraries and Information Science.

McLoughlin, G. J. (1997). *The National Information Infrastructure: The federal role*. Washington, D.C.: Congressional Research Service.

Marcum, D. B. (1996). Redefining community through the public library. *Daedalus* 125 (4): 191-206 [special issue on public libraries, *Books, Bricks, and Bytes*].

Meltzer, M., and Palau, S. (1996). *Acquiring critical thinking skills*. New York, N.Y.: W. B. Saunders.

Mendels, P. (1997). FCC to open net discount program for schools and libraries. *New York Times*, 30 November, B10.

Mueller, M. (1997). Universal service and the telecommunications act: Myth made law. *Communications of the ACM* 40(3): 39-47.

Moen, W. E., and McClure, C. R. (1997). *An evaluation of the federal government's implementation of the Government Information Locator Service (GILS)*. Washington, D.C.: Government Printing Office.

National Center for Education Statistics. (1997). *Public libraries in the United States: 1994* [NCES 97-418]. Washington, D.C.: Department of Education.

National Commission on Libraries and Information Science. (1994). *Briefings on libraries and the information superhighway*. Washington, D.C.: National Commission on Libraries and Information Science.

Notess, G. R. (1997). *Government information on the Internet*. Lanham, Md.: Bernan Press.

OMB approves USF application forms - applications to be sent early next week. (December 5, 1997). *Farnet's Washington Update*, Washington, D.C.: Farnet, Inc. Available: <http://www.farnet.org>.

Panel reaches accord to break GPO monopoly. (1997). *Federal Computer Week*, 11:1, 80 (8 September).

Schiesel, S. (1997). Fund to aid technology in schools facing big cuts by FCC, *New York Times*, 15 December. Available: <http://www.nytimes.com/library/cyber/week/121597fund.html>.

Smith, M., and Rowland, G. (1997). To boldly go: Searching for output measures for electronic services, *Public Libraries* (May-June): 168-72.

U.S. Department of Education. (1997). U.S. Department of Education technology initiatives. <http://www.ed.gov/Technology/>.

U.S. National Advisory Council on the National Information Infrastructure. (1996). *Kickstart initiative: Connecting America's communities to the information superhighway*. Washington, D.C.: U.S. National Advisory Council on the National Information Infrastructure.

Wyman, S. K., and McClure, C. R. (1997). *User and system-based quality criteria for evaluating information resources and services available from federal websites: Final report*. Syracuse, NY: Syracuse University, School of Information Studies.

Werbach, Kevin. (1997). *Digital tornado: The Internet and telecommunications policy*. Washington, D.C.: Federal Communications Commission. Available: <http://www.fcc.gov/Bureaus/OPP/working_papers/opp29.pdf>.

BEST COPY AVAILABLE

ABOUT THE AUTHORS

John Carlo Bertot and Charles R. McClure and have worked together successfully on a number of research projects--most recently the *1997 Public Libraries and the Internet* study (the Executive Summary of this report appears on the ALA homepage <www.ala.org/oitp/>) and the *Evaluation of the Online at PA Libraries Project*. John Carlo Bertot is assistant professor at the Department of Information Systems, University of Maryland Baltimore County, and is faculty associate at the Maryland Institute for Policy Analysis and Research. He has published extensively on statewide and public library networking activities, and on topics related to federal, state, and county information policies and the use of information technology to deliver information resources and services.

At present, Bertot and McClure are the principal investigators for an evaluation study of the DelAWARE project, Delaware's online information resource. They are also the principal investigators for a project that is assessing the impact of networking on public libraries in Victoria, Australia.

Charles R. McClure is a distinguished professor of information studies at Syracuse University, School of Information Studies--one of only eight at the university to receive that title. He has published extensively on topics related to planning and evaluation of information and networked services, information policy, and libraries and the Internet. As co-principal investigator he just completed a one year study with Bertot funded by the Office of Commonwealth Libraries that resulted in the report *Evaluation of the Online at PA Libraries Project: Public Access to the Internet Through Public Libraries*; he is also Co-PI with Bertot on a study assessing Maryland's statewide network, Sailor, completed in September 1996.

In 1995, McClure and Bertot completed a study funded by the National Science Foundation (NSF) that examined federal policies related to enhancing the role of public libraries in the networked environment. Also in 1995, as part of the NSF study with additional funding from the National Commission on Libraries and Information Science (NCLIS), McClure and Bertot produced *Internet Costs and Cost Models for Public Libraries*. McClure, with Bertot and Zweizig, completed a national survey of public libraries and their use of the Internet. This study and its final report, *Public Libraries and the Internet: Survey Findings and Key Issues*, was published in September 1996.

McClure has a proven track record of managing and successfully completing research projects funded by the U.S. Department of Education, the National Science Foundation, the U.S. Geological Survey, the Government Printing Office, and the NCLIS. His research has been recognized by awards from the American Society for Information Science, the American Library Association, and the Association for Library and Information Science educators. He was the founding editor of *Internet Research* and is a frequent speaker at professional associations and meetings.